

**UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF WISCONSIN**

HYDRO-THERMAL CORPORATION,

PLAINTIFF,

V.

CASE NO. 07-C-918

**PRO-SONIX, LLC AND
BRUCE A. CINCOTTA,**

DEFENDANTS.

CLAIM CONSTRUCTION ORDER

I. Procedural History

On October 12, 2007, Hydro-Thermal Corp. filed a complaint alleging that Pro-Sonix, LLC and Bruce A. Cincotta (“Cincotta”) infringed on its patent, United States Letters Patent No. 6,082,712 (“the ‘712 patent”), for a “Direct Contact Steam Injection Heater.” (Docket No. 1.) Although this initial complaint alleged infringement of other patents, the complaint was subsequently amended and now alleges only the infringement of the ‘712 patent. (Docket No. 52.)

On April 29, 2009, this court conducted a hearing pursuant to Markman v. Westview Instruments, Inc., 517 U.S. 370 (1996). Prior to this hearing, the parties submitted briefs outlining their respective positions. (Docket Nos. 53 (defendants’ initial brief); 54 (Affidavit of Roger Pettit in support of Defendants’ Markman Brief); 55 (plaintiff’s initial brief); 56 (Declaration of David G. Hanson); 58 (defendants’ response); 60 (plaintiff’s response); 61 (Declaration of David G. Hanson)).

The plaintiff initially identified the following claims as being in need of construction by the court: “combining region,” “coaxial channel,” “inlet portion,” “axial direction” and “flow area.”

(See Docket No. 55 at 2-3.) However, there appears to be no dispute as to the meaning of the claims

“inlet portion” or “flow area” as the defendants’ brief and response are devoid of any discussion as to the meaning of these terms. Therefore, the court shall not further discuss these terms. Additionally, the parties’ briefs and the statements of counsel at the Markman hearing made clear that the construction of “coaxial channel” and “axial direction” depend upon the construction of combining region. Specifically, as framed by the parties, the issue comes down to whether the combining region may be simply some area within the heater body or if it must be a separate and distinct structure. Therefore, the court’s analysis shall be directed to construing “combining region.”

II. Applicable Law

“[T]he construction of a patent, including terms of art within its claim, is exclusively within the province of the court.” Markman, 517 U.S. at 373. “A district court’s Markman order is an explanation to the parties of the reasoning behind its claim construction.” MercExchange, LLC v. eBay, Inc., 401 F.3d 1323, 1329 (Fed. Cir. 2005). “[T]he claim construction task requires th[e] court to discern the meaning of that [disputed] term in the context of this invention and field of art.” Curtiss-Wright Flow Control Corp. v. Velan, Inc., 438 F.3d 1374, 1379 (Fed. Cir. 2006). “Claim construction is a fact-dependent, invention-oriented exercise in logic and law.” SmithKline Beecham Corp. v. Apotex Corp., 439 F.3d 1312, 1322 (Fed. Cir. 2006). When construing claims, if possible, a court should give meaning to all terms in a claim. Pause Tech. LLC v. TiVo Inc., 419 F.3d 1326, 1334 (Fed. Cir. 2005) (citing Merck & Co. v. Teva Pharms. USA, Inc., 395 F.3d 1364, 1372 (Fed. Cir. 2005)).

A court undertaking a claim construction analysis begins by giving words of the claim “their ordinary and customary meaning.” Old Town Canoe Co. v. Confluence Holdings Corp., 448 F.3d 1309, 1315 (Fed. Cir. 2006). This meaning may be discerned by analyzing the intrinsic evidence, id. at 1316, including the patent itself and the prosecution history. Vitronics Corp. v. Conceptiontronic, 90

F.3d 1576, 1582 (Fed. Cir. 1996); see also V-Formation, Inc. v. Benetton Group SpA, 401 F.3d 1307, 1310 (Fed. Cir. 2005).

III. Analysis

The '712 patent refers to a device that heats liquids or slurries by injecting high velocity steam into the fluid. The fluid enters the heater body and the high pressure steam enters through a diffuser. The steam then mixes with the liquid, thereby heating it, and the combined heated fluid exits the heater body.

Claim 1 states:

A direct contact steam injection heater comprising:

a heater body having a steam inlet, a liquid inlet, a combining region and a heated liquid discharge outlet;

the combining region having an inlet and an outlet located within the heater body in which steam and liquid are combined to generate heated liquid;

a Mach diffuser that receives the flow of steam into the heater body and discharges the steam into the liquid flowing through the combining region, wherein a coaxial channel is located between the Mach diffuser and an inlet portion of the combining region of the heater body and the Mach diffuser contains a plurality of steam diffusion holes through which the steam is discharged into the liquid flowing through the channel between the Mach diffuser and the inlet portion of the combining region; and

an adjustably positionable cover over the steam diffusion holes contained in the Mach diffuser that is movable relative to the Mach diffuser to adjustably expose one or more of the steam diffusion holes in the Mach diffuser and modulate the amount of steam discharged through the Mach diffuser into the liquid flowing through the combining region;

wherein:

the steam pressure upstream of the Mach diffuser is sufficient to create sonic choked flow conditions through the exposed diffusion holes through which steam is discharged from the Mach diffuser into the flow of liquid flowing through the channel between the Mach diffuser and the inlet portion of the combining region;

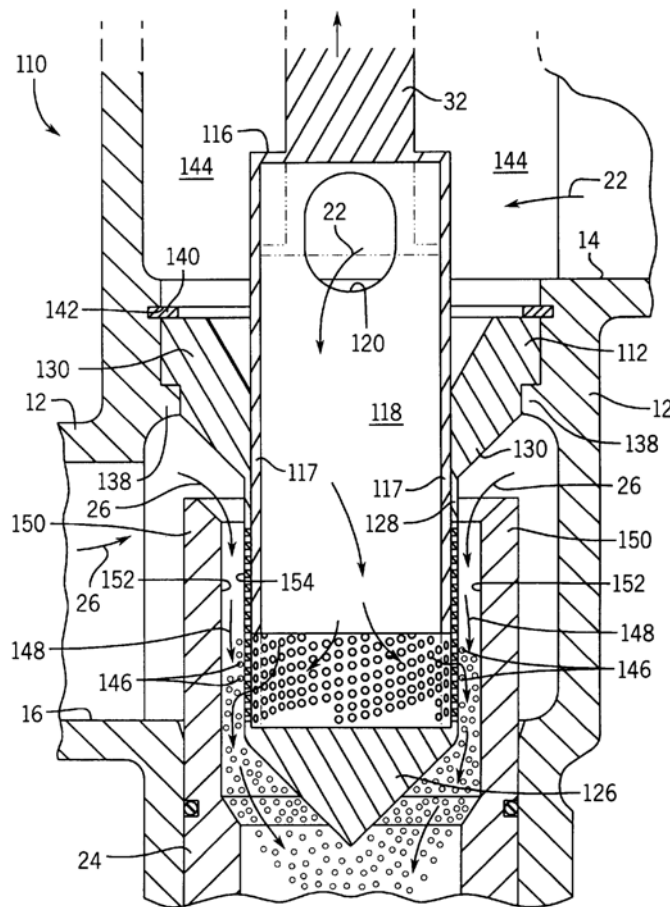
the coaxial channel has a flow area substantially less than a flow area of a downstream portion of the combining region in which the injected steam condenses; and

liquid flows through the inlet portion and the downstream portion of the combining region in an axial direction and steam flows in generally radial directions as the steam flows through the one or more steam diffusion holes in the Mach diffuser into the axial liquid flow through the channel between the Mach diffuser and the combining region of the heater body.

(Docket No. 54-2 at 7-8.)

The following diagram is contained in the patent as Figure 5 and depicts the area subject to dispute:

FIG. 5



The fluid to be heated, 26, enters through the product inlet, 16. The steam, 22, exits through high velocity radial jets, 146. The steam and the fluid to be heated then meets in the “combining region.” On this diagram, the combining region is depicted as a “combining tube,” 24. The use of the combining tube, which the plaintiff described as a tube-like sleeve around the diffuser, redirects

the fluid to be heated, and increases the pressure by forcing it through a narrower space, and is adjustable to optimize the heating of the fluid. Thus, the fluid to be heated travels along the route depicted by the arrows identified as number 26 and then flows in an axial direction, 148. Therefore, the combining region on this diagram is the narrow space between the wall, 152, and the high velocity radial jets, 146.

A. Combining Region

The defendants contend that the patent requires a combining region to be a separate structure, such as a combining tube. In support of this contention, the defendants point to the fact that in the description of the drawings in the patent, it appears that combining region and combining tube are used interchangeably; both terms are utilized in describing Number 24 on the drawings. The plaintiff contends that a combining tube is simply one embodiment of a combining region and although the drawings depict the invention with a combining tube for the combining region, the claims do not require this or any other structure to be used as the combining region.

The defendants point to the prosecution history of the patent in an effort to support their contention that the combining region must be a separate structure and specifically the fact that in response to rejections by the Patent and Trademark Office (“PTO”) the inventor made certain changes to its application.

For example, it added “a combining region” to its initial description of the direct contact steam injection heater so that it read as it read “a heater body having a steam inlet, a liquid inlet, a combining region and a heated liquid discharge outlet,” as it does in the patent. The defendants contend that this change was necessary to distinguish the invention from the prior art, specifically United States Letters Patent No. 3,197,337 (“Schink”). However, the prosecution history of the ‘712 patent disproves this contention.

Schink also has a combining region. However, utilizing a combining tube as the combining region was not necessary to distinguish the '712 patent from Schink. Rather, what distinguished the '712 patent from Schink, in the view of the PTO, was the direction of the flow. In Schink, the flow was helical; in the '712 patent, after the claims were amended, the flow is limited to being axial. The amendments made in response to the PTO's rejection of the application on the basis of obviousness, (see Docket No. 58 at 3-4), as well as the PTO's statements in rejecting the application, (Docket No. 58-4 at 6-7), demonstrate that it was the absence of this axial flow limitation that resulted in the rejection of the prior applications. Once these axial flow limitations were added, the application was approved. The court finds nothing in the prosecution history to indicate that these modifications somehow indicate that the combining region must be a structure separate from the heater body.

In fact, the patent itself clearly supports the plaintiff's contention that a combining tube is simply one embodiment of the combining region. In the detailed description of the drawings, at column 5, lines 35-36, the patent states, "As depicted in FIG. 2, the combining region *may* take the form of an adjustably positionable combining tube." Column 5, lines 35-36 (emphasis added). If it *may* take the form of "an adjustably positionable combining tube," necessarily, it also *may not*.

Perhaps the argument could be made that the use of "may" still requires that the combining region be an independent structure, but not necessarily a tube. However, the court rejects this contention. The common and ordinary use of the word "region" connotes something amorphous as opposed to "structure," "unit," "device," or any number of other words including "tube" that would indicate a need for the combining region to be separate from the heater body. Thus, the court finds that the use of the word "region" is persuasive evidence that the combining region may be an ill-defined area within the heater body as opposed to discrete independent structure.

Further support for the conclusion that the combining region need not be a structure that is separate and distinct from the heater body can be found in the patent. The patent notes: “Alternatively, the invention can be carried in a heater in which the combining region is not an adjustably positionable combining tube.” Column 5, lines 46-48. The patent then continues: “For example, see above incorporated U.S. Pat. No. 5,622,655 entitled ‘Sanitary Direct Contact Steam Injection Heater 50 Method’, by Bruce Cincotta et al. issuing on Apr. 22, 1997, which shows a combining region integral with the heater body.” This patent, referred to here as the ‘655 patent, depicts a similar heater where there is no allegation that there is any structure in which the combining occurs other than the heater body, and thus it is clear that the ‘712 patent anticipates the combining region being an area within the heater body and not any sort of a separate structure.

The court finds further support for the conclusion that a combining tube, or any other structure, is not required for the combining region, in the fact that the term “combining tube” appears in the patent almost exclusively in the descriptions of the drawings. Although the drawings depict an embodiment of the invention where a combining tube is used as the combining region, and figures 2-5 depict a preferred embodiment of the invention, the patent is careful to note that “the invention is not limited to this specific embodiment.” Column 6, lines 36-38. The only other use of the term “combining tube” is a single use in the abstract. Significantly, the term is entirely absent from the claims. In the claims, only “combining region” is used. Thus, the patent makes clear that a combining tube is a combining region but not all combining regions are combining tubes.

Finally, the court finds unpersuasive the defendants’ contention that because the claims identify the heater body and the combining region as each having inlets and outlets means that the combining region must be a separate structure. Claims 1 and 16 state:

a heater body having a steam inlet, a liquid inlet, a combining region and a heated liquid discharge outlet;

the combining region having an inlet and an outlet located within the heater body in which steam and liquid are combined to generate heated liquid;

Even if the combining region is simply an amorphous space within the heater body, the fluid to be heated must come into it, and after combining with the steam, the heated fluid must exit. Likewise, the fluid to be heated and the heated fluid must enter and exit the heater body. Thus, the heater body and the combining region will necessarily have inlets and outlets. However, the patent does not require separate inlets and outlets for both the heater body and the combining region. The inlets for the combining region may be the same as those for the heater body and likewise the same single outlet may be the outlet for the combining region and the heater body. Even if a separate structure is used for the combining region, such as a tube, as is made clear by the defendants' Exhibit 2, the boundaries of the inlet and outlet for the combining region are merely arbitrary divisions along the path the liquid to be heated flows. There is nothing to indicate that the patent requires an inlet or outlet to be a structure; rather, the inlet and outlets of the combining region may be nothing more than arbitrary distinctions along the path the fluid flows through the heater.

Having determined that "combining region" means the area within the heater body, which may or may not be a structure separate from the heater body, where the fluid to be heated mixes with the high pressure steam, the court shall now turn to the remaining disputed claims.

B. Coaxial Channel

As for "coaxial channel" two of the limitations sought by the defendants' in their reply, (Docket No. 58 at 12), are required and non-controversial. The limitations are explicitly set forth in the claims. The coaxial channel:

(1) "is located between the Mach diffuser and an inlet portion of the combining region of the heater body;" and

(2) "has a flow area substantially less than a flow area[a] of a downstream portion of the combining region in which the injected steam condenses." (The court notes that the "a" at the end of

“area” in Claim 1 is missing. See column 7, line 16. This is clearly a typo because in Claim 16 wherein this language of Claim 1 is repeated, see column 9, line 15, the word “area” is used and only “area” makes sense.)

However, the two other limitations sought by the defendants, “that the coaxial channel begins at the inlet portion of the combining region,” and “that no range of equivalents be permitted on the grounds that Hydro-Thermal introduced structural limitation to avoid rejection on grounds of patentability,” (Docket No. 58 at 12), are unsustainable. Neither the patent nor the intrinsic evidence demonstrate that the Hydro-Thermal introduced any structural limitation upon the coaxial channel claim during its prosecution of the patent so as to avoid a rejection based upon patentability. Further, absent the structural limitation on “combining region” advocated by the defendants, the defendants have not presented sufficient evidence to permit the conclusion that the coaxial channel must necessarily begin at the inlet portion of the combining region.

C. Axial Direction

Finally, the court turns to the term “axial direction.” Although the plaintiff originally identified the term “axial direction” as being in need of construction, (Docket No. 55 at 2), the parties in their replies instead refer to “axial flow.” Both are used in the patent but “axial direction” is used in the claims whereas “axial flow” is absent from the claims but appears in the abstract, summary, and detailed descriptions of the drawings. Thus, there is no claim in the patent relating to “axial flow” but rather only a claim relating to “axial direction.” Nonetheless, for present purposes, the distinction is inconsequential. The crucial term is “axial” in that this term was added so as to distinguish the ‘712 patent from Schink wherein the direction of the flow was helical. In the ‘712 patent, the liquid to be heated flows in an axial direction through the combining region. It is not necessary to engage in any sort of detailed analysis to discern the meaning of these terms; the

common and ordinary meaning of the terms is clear. “Axial direction” is a direction related to, characterized, or forming an axis.

IV. Conclusion

For the foregoing reasons, the court construes the disputed claims in the ‘712 patent as follows:

“Combining region” is the area within the heater body, which may or may not be a structure separate from the heater body, where the fluid to be heated mixes with the high pressure steam.

“Coaxial channel” is located between the Mach diffuser and an inlet portion of the combining region of the heater body, and has a flow area substantially less than a flow area of a downstream portion of the combining region in which the injected steam condenses.

“Axial direction” is a direction related to, characterized, or forming an axis.

SO ORDERED.

IT IS FURTHER ORDERED that the court will conduct a telephone conference on **September 22, 2009 at 8:30 am.** to discuss further scheduling. The court will initiate the call.

Dated at Milwaukee, Wisconsin this 9th day of September, 2009.

s/AARON E. GOODSTEIN
U.S. Magistrate Judge